INDEX

Action potential
depression, auditory masking duration effect, 988
depression, auditory masking intensity effect, 1001
Acoustic stimulation
long-duration, response of superior olivary neurons to, 706
ADRIAN, H. O., 706
Afferent fibers: *see also* Nerve fibers
spinal cord, cortically evoked depolarization, 63
Afferent nerve
stimulation of, effect on Renshaw cells, 1063
Afterdischarge
photically evoked, origin of in visual cortex, 1048
ALBERTS, W. W., 546
Alpha motoneurons
cerebellar stimulation sites affecting, 210
hind-limb, cerebellar control of, 172
stretch reflexes, gamma loop interruption on cerebellar control of, 193
AMES, A. III, M. SAKANOUE, AND S. ENDO. Na, K, Ca, Mg, and Cl concentrations in choroid plexus fluid and cisternal fluid compared with plasma ultrafiltrate, 672
Amygdala
heart rate after electrical stimulation, 893
ANDERSEN, P., J. C. ECCLES, AND Y. LØYNING. Location of postsynaptic inhibitory synapses on hippocampal pyramids, 592
ANDERSEN, P., J. C. ECCLES, AND Y. LØYNING. Pathway of postsynaptic inhibition in the hippocampus, 608
ANDERSEN, P., J. C. ECCLES, T. OSHIMA, AND R. F. SCHMIDT. Mechanisms of synaptic transmission in the cuneate nucleus, 1096
ANDERSEN, P., J. C. ECCLES, R. F. SCHMIDT, AND T. YOKOTA. Slow potential waves produced in the cuneate nucleus by cutaneous volleys and by cortical stimulation, 78
ANDERSEN, P., J. C. ECCLES, R. F. SCHMIDT, AND T. YOKOTA. Depolarization of presynaptic fibers in the cuneate nucleus, 92
ANDERSEN, P., J. C. ECCLES, R. F. SCHMIDT, AND T. YOKOTA. Identification of relay cells and interneurons in the cuneate nucleus, 1080
ANDERSEN, P., J. C. ECCLES, AND T, A, SEARS. Cortically evoked depolarization of primary afferent fibers in the spinal cord, 63
ANDERSEN, P., J. C. ECCLES, AND P. E. VOORHOEVE. Postsynaptic inhibition of cerebellar Purkinje cells, 1138
Anesthetic: *see* Thiamylal sodium
Antidromic stimulation
response of cortical pyramidal tract neurons, 828
ANTUNES-RODRIGUES, J., 394
Auditory cortex
ablation, effects on binaural time differences, 15
Auditory masking
physiological observations of, 988, 1001
duration effect on action potential depression, 988
intensity effect on action potential depression, 1001
Auditory nerve
action potentials, masking duration effect on, 988
action potentials, masking intensity effect on, 1001
primary, fiber discharge pattern and inhibition, 768
Auditory stimulation
and responses in opossum thalamus, 1026
medullary response to monaural and binaural, 1174
wave activity in superior olivary complex after, 814
Augmenting responses, cortical
synaptic activities and, 133
Axons: *see also* Nerve fibers
optic tract, visual receptive fields of, 1154

BALVIN, R., 334
Barbiturate
sensitivity, of visual receptive fields, 1154
Behavior
avoidance, after mammillothalamic tractomy, 753
in chronic decerebrate animal, 635
sympathetic enhancement of sensory input in arousal, 493
BELL, C., G. SIERRA, N. BUENDIA, AND

J. P. SEGUNDO. Sensory properties of neurons in the mesencephalic reticular formation, 961
BIGNALL, K. E. AND L. T. RUTLEDGE. Origin of a photically evoked afterdischarge in cat visual cortex, 1048
BISHOP, G. H., 788
Blood pressure
septal area stimulation effect on, 394
BOUDREAU, J. C., 814
Brain stem
neuronal auditory responses, 1174
superior olivary complex, response to long-duration acoustic stimuli, 706
wave activity in superior olivary complex, 814
BROOKS, C. McC., 878
BROWN, K. T., 682
BUENDIA, N., 961

Calcium
concentrations in CSF, compared with plasma ultrafiltrate, 672
Central nervous system
neuroglia and extracellular space in leech, 645
of leech, electron microscopic study of, 229
of leech, physiological properties and neuron-glia relationship, 290
Cerebellar ablation
auditory cortex, and tonal pattern discrimination, 15
stretch responses during chronic, 49
Cerebellar stimulation
localization of motor effects of, 210
of α-motoneuron stretch reflexes, gamma loop section effect on, 193
response of alpha and gamma motoneurons to deep, 172
Cerebral cortex
area 4, excitation of, events following, 334
association area, convergence upon neurons of, 620
auditory field, representation in primitive mammal, 37
primitive mammal (echidna), representation in, 37
sensorimotor field, representation in primitive mammal, 37
stimulation of, causing depolarization of primary afferent fibers, 63
visual field, representation in primitive mammal, 37
Cerebrospinal fluid
electrical potential of, 942
electrolytes in, compared with plasma ultrafiltrate, 672
CHERNETSKI, K. E. Sympathetic enhancement of peripheral sensory input in the frog, 493
Chloride
concentrations in CSF, compared with plasma ultrafiltrate, 672
CLARE, M. H., 788
COATS, A. C. Physiological observations of auditory masking. I. Effect of masking duration, 988
COATS, A. C. Physiological observations of auditory masking. II. Effect of masking intensity, 1001
COGGESHALL, R. E. AND D. W. FAWCETT. The fine structure of the central nervous system of the leech, *Hirudo medicinalis*, 229
Color discrimination
behavioral evidence for, in cat, 323
Conduction
saltatory, action currents developed by single nodes of Ranvier, 1199
Conscious sensation
levels of, produced by stimulation of human somatosensory cortex, 546
Convergence
inhibitory, on Renshaw cells, 1063
upon association cortex neurons, 620
COOTE, J., 107
Cortical intracellular potentials
during augmenting and recruiting responses, 117, 133
hyperpolarizing currents on evoked membrane potential changes, 117
synaptic pattern in pyramidal and nonpyramidal tract neurons, 133
COVIAN, M. R., J. ANTUNES-RODRIGUES, AND J. J. O'FLAHERTY. Effects of stimulation of the septal area upon blood pressure and respiration in the cat, 394
COWEY, A. Projection of the retina on to striate and prestriate cortex in the squirrel monkey, *Saimiri sciureus*, 366
Cuneate nucleus
depolarization of presynaptic fibers of, 92
relay cells and interneurons in, 1080
slow waves by cutaneous volleys and cortical stimulation, 78
synaptic transmission in, mechanism of, 1096

Decerebrate animal
behavior in extended survival, 635
DELATTRE, L. D., 546
Depolarization
of presynaptic cuneate nucleus fibers, 92
presynaptic, by cortex, 63
DIAMOND, I. T., 15, 1026
Discharge
of primary auditory fibers, 768

Dorsal root viscerotomes
relation to gastrointestinal tract, 107
Dow, R. S., 172, 193, 210
Downman, C. B. B., 107
Dubner, R. and L. T. Rutledge. Recording and analysis of converging input upon neurons in cat association cortex, 620

Eccles, J. C., 63, 78, 92, 592, 608, 1080, 1096, 1138
EEG: *see* Electroencephalogram
Eighth nerve: *see* Auditory nerve
Electrical potential
of cerebrospinal fluid, 942
Electrical stimulation
human somatosensory cortex, levels of conscious sensation produced by, 546
of amygdala, heart rate following, 893
of optic nerve and retina, intraretinal response to, 682
of septal area, effect on blood pressure and respiration, 394
vestibular and muscle nerve, effect on pyramidal tract neurons, 481
Electroencephalogram
theta rhythm from hippocampal pyramidal neurons, 1011
Electrolytes: *see also* Calcium; Chloride; Magnesium; Potassium; Sodium
in cerebrospinal fluid, compared with plasma ultrafiltrate, 672
Endo, S., 672
Erickson, R. P., J. A. Jane, R. Waite, and I. T. Diamond. Single neuron investigation of sensory thalamus of the opossum, 1026
Evarts, E. V. Temporal patterns of discharge of pyramidal tract neurons during sleep and waking in the monkey, 152
Evoked potentials
cortical, form and distribution under polarizing currents, 788
nonstriate, by retinal projection, 366
postsynaptic, in corticospinal neurons during augmentation and recruitment, 133
transmembrane, and hyperpolarizing currents, 117
Excitation
electrical, of pyramidal motor cortex neurons, events following, 334
synaptic, of pyramidal motor cortex neurons, events following, 334
Eyzaguirre, C., 464

Fawcett, D. W., 229
Feinstein, B., 546
Fencl, V., 942
Frank, K., 913, 928
Fujita, Y. and T. Sato. Intracellular records from hippocampal pyramidal cells in rabbit during theta rhythm activity, 1011

Gamma loop
section of, effect on cerebellar stimulation of α-motoneuron stretch reflexes, 193
Gamma motoneurons
cerebellar stimulation sites affecting, 210
hind-limb, cerebellar control of, 172
Gastrointestinal tract
dorsal root viscerotomes and, 107
Geniculate body
lateral, visual receptive fields of cells of, 1154
Glaser, G. H., 49
Glial cells
and neurons, ionic composition in leech CNS, 645
in leech CNS, neuron-glia relationship, 290
Goldberg, J. M., H. O. Adrian, and F. D. Smith. Response of neurons of the superior olivary complex of the cat to acoustic stimuli of long duration, 706

Hazarika, N. H., J. Coote, and C. B. B. Downman. Gastrointestinal dorsal root viscerotomes in the cat, 107
Heart rate
after amygdaloid electrical stimulation, 893
Held, D., V. Fencl, and J. R. Pappenheimer. Electrical potential of cerebrospinal fluid, 942
Henatsch, Eva-M., 210
Henatsch, H. D., 210
Henatsch, H. D., E. Manni, and R. S. Dow. Effects of gamma loop interruption on cerebellar control of individual alpha motoneuron stretch reflexes, 193
Henatsch, H. D., E. Manni, J. H. Wilson, and R. S. Dow. Linked and independent responses of tonic alpha and gamma hind-limb motoneurons to deep cerebellar stimulation, 172
Higgins, D. C. and G. H. Glaser. Stretch responses during chronic cerebellar ablation. A study of reflex instability, 49
Hippocampal pyramids: *see* Hippocampus
Hippocampus
inhibitory synapses, location of, 592
postsynaptic inhibitory pathway in, 608
pyramidal cells, intracellular rhythm, 1011

Inhibition
of primary auditory nerve fibers, 768

of Renshaw cells, by afferent nerve stimulation, 1063
postsynaptic, of cerebellar Purkinje cells, 1138
postsynaptic, pathway of in hippocampus, 608
postsynaptic synapses, location in hippocampus, 592
presynaptic, in cuneate nucleus, 78, 92
presynaptic, in spinal cord, evoked by descending systems, 63
recurrent collateral, in motor cortex, 855
reticular mechanisms on α-extensor motoneurons, 579
reticular, pharmacological actions, 1127
reticular versus cerebellar, on α-extensor motoneurons, 1117
Inhibitory synapses: *see* Synapses, inhibitory
Interneurons
cuneate nucleus, identification of, 1080
Renshaw cells, inhibition of, 1063
ISHIKAWA, T., 878

JANE, J. A., 1026
JASPER, H., 828, 855

KATO, M., 1063
KATSUKI, Y., 768
KIDD, C., 1
KOIZUMI, K., T. ISHIKAWA, AND C. MCC. BROOKS. Control of activity of neurons in the supraoptic nucleus, 878
KRIECKHAUS, E. E. Decrements in avoidance behavior following mammillothalamic tractomy in cats, 753
KUFFLER, S. W., 645
KUFFLER, S. W. AND D. D. POTTER. Glia in the leech central nervous system: physiological properties and neuron-glia relationship, 290

LANDAU, W. M., G. H. BISHOP, AND M. H. CLARE. Analysis of the form and distribution of evoked cortical potentials under the influence of polarizing currents, 788
Larynx
mechanoreceptors of cat, functional characteristics, 464
LENDE, R. A. Representation in the cerebral cortex of a primitive mammal: sensorimotor, visual, and auditory fields in the echidna (*Tachyglossus aculeatus*), 37
LEVIN, G., 546
LIBET, B., W. W. ALBERTS, E. W. WRIGHT, JR., L. D. DELATTRE, G. LEVIN, AND B. FEINSTEIN. Production of threshold levels of conscious sensation by electrical stimulation of human somatosensory cortex, 546
LLINAS, R. Mechanisms of supraspinal actions upon spinal cord activities. Differences between reticular and cerebellar inhibitory actions upon alpha extensor motoneurons, 1117
LLINAS, R. Mechanisms of supraspinal actions upon spinal cord activity. Pharmacological studies on reticular inhibition of alpha extensor motoneurons, 1127
LLINAS, R. AND C. A. TERZUOLO. Mechanisms of supraspinal actions upon spinal cord activities. Reticular inhibitory mechanisms on alpha extensor motoneurons, 579
LØYNING, Y., 592, 608
LØYNING, Y., T. OSHIMA, AND T. YOKOTA. Site of action of thiamylal sodium on the monosynaptic spinal reflex pathway in cats, 408

Magnesium
concentrations in CSF, compared with plasma ultrafiltrate, 672
MANNI, E., 172, 193
MANNI, E., H. D. HENATSCH, EVA-M. HENATSCH, AND R. S. DOW. Localization of facilitory and inhibitory sites in and around the cerebellar nuclei affecting limb posture, alpha and gamma motoneurons, 210
MASTERTON, R. B. AND I. T. DIAMOND. Effects of auditory cortex ablation on discrimination of small binaural time differences, 15
MCILWAIN, J. T. Receptive fields of optic tract axons and lateral geniculate cells: peripheral extent and barbiturate sensitivity, 1154
Mechanoreceptors
laryngeal of cat, functional characteristics of, 464
MEGIRIAN, D. AND R. TROTH. Vestibular and muscle nerve connections to pyramidal tract neurons of cat, 481
MELLO, N. K. AND N. J. PETERSON. Behavioral evidence for color discrimination in cat, 323
Membrane potentials
hyperpolarizing currents on evoked changes in, 117
Mephensin
in reticular inhibition of α-extensor motoneurons, 1127
MORI, K., 1192
MORLOCK, N. L., K. MORI, AND A. A. WARD, JR. A study of single cortical

neurons during spreading depression, 1192
Motoneurons: *see also* Alpha motoneurons; Gamma motoneurons; Spinal motoneurons
α-extensor, pharmacological actions in inhibition, 1127
α-extensor, reticular and cerebellar inhibitory actions on, 1117
α-extensor, reticular inhibition of, 579
flexor, pattern of response to natural stimulation, 451
Motor cortex: *see* Cerebral cortex (area 4)
MOUSHEGIAN, G., A. RUPERT, AND M. A. WHITCOMB. Brain-stem neuronal response patterns to monaural and binaural tones, 1174
Muscle
position and movement, effect on groups I and II muscle spindle afferents, 429
Muscle nerve
stimulation of, effect on pyramidal tract neurons, 481
Muscle spindles
afferents of groups I and II, response to muscle position and movement, 429
MUSGRAVE, F. S., 133

Natural stimulation
flexor motoneuron response to, 451
NELSON, P. G. AND K. FRANK. Extracellular potential fields of single spinal motoneurons, 913
NELSON, P. G. AND K. FRANK. Orthodromically produced changes in motoneuronal extracellular fields, 928
Nerve fibers
cutaneous, cuneate slow waves by volleys of, 78
Neuroglia
and extracellular space in leech CNS, 645
Neuronal impulse sequences
periodicities in, 517
Neuronal mechanisms
in somesthesis, role of lateral cervical nucleus, 1
Neurons: *see also* Motoneurons; Interneurons; Purkinje cells; Pyramidal neurons; and parts of neurons
and glial cells, ionic composition in leech CNS, 645
association cortex, convergence upon, 620
cortical, during spreading depression, 1192
cortical, evoked potentials and polarization, 788
cortical pyramidal tract, antidromic responses in, 828
cortical, synaptic activities during thalamocortical stimulation, 117
corticospinal, postsynaptic potential patterns during augmentation and recruitment, 133
cuneate, and cuneothalamic relay, mechanisms of synaptic transmission, 1096
cuneate, cuneothalamic relay and interneurons, 1080
lateral cervical, functional properties of, 1
mesencephalic, sensory properties, 961
of leech CNS, relation to glial cells, 290
pyramidal tract, recurrent collateral inhibition in, 855
pyramidal tract, temporal discharge patterns during sleep and waking, 152
pyramidal tract, vestibular and muscle nerve stimulation effect on, 481
superior olivary, and long-duration acoustic stimuli, 706
superior olivary, wave activity by auditory stimuli, 814
supraoptic nucleus, reactions to hypertonic solutions and osmotic stimuli, 878
thalamic somatic sensory, impulse sequences of, 517
NICHOLLS, J. G. AND S. W. KUFFLER. Extracellular space as a pathway for exchange between blood and neurons in the central nervous system of the leech: ionic composition of glial cells and neurons, 645
Nodes of Ranvier
action currents developed by, new measurement of, 1199
NOMOTO, M., N. SUGA, AND Y. KATSUKI. Discharge pattern and inhibition of primary auditory nerve fibers in the monkey, 768

O'FLAHERTY, J. J., 394
OGDEN, T. E. AND K. T. BROWN. Intraretinal responses of the cynamolgus monkey to electrical stimulation of the optic nerve and retina, 682
OLIPHANT, M. C., 893
Optic nerve
stimulation of, intraretinal response to, 682
OSHIMA, T., 408, 1096
Osmotic stimulation
activity of supraoptic nucleus neurons, 878
OSWALDO-CRUZ, E. AND C. KIDD. Functional properties of neurons in the lateral cervical nucleus of the cat, 1

PAPPENHEIMER, J. R., 942
PETERSON, N. J., 323
Picrotoxin
in reticular inhibition of α-extensor motoneurons, 1127

Plasma
ultrafiltrate, compared with electrolytes in CSF, 672
POGGIO, G. F. AND L. J. VIERNSTEIN. Time series analysis of impulse sequences of thalamic somatic sensory neurons, 517
Polarization of cortex
and evoked cortical potentials, form and distribution, 788
Polysensory systems
response to artificial stimuli, 961
Posture, limb
and cerebellar control, 210
Potassium
concentrations in CSF, compared with plasma ultrafiltrate, 672
POTTER, D. D., 290
Presynaptic fibers
cuneate nucleus, depolarization of, 92
Purkinje cells
postsynaptic inhibition of, 1138
PURPURA, D. P. AND R. J. SHOFER. Cortical intracellular potentials during augmenting and recruiting responses. I. Effects of injected hyperpolarizing currents on evoked membrane potential changes, 117
PURPURA, D. P., R. J. SHOFER, AND F. S. MUSGRAVE. Cortical intracellular potentials during augmenting and recruiting responses. II. Patterns of synaptic activities in pyramidal and nonpyramidal tract neurons, 133
Pyramidal neurons
hippocampal, intracellular theta rhythm, 1011

Recruiting responses, cortical
synaptic activites and, 133
REIS, D. J. AND M. C. OLIPHANT. Bradycardia and tachycardia following electrical stimulation of the amygdaloid region in monkey, 893
RENKIN, B. Z. AND A. B. VALLBO. Simultaneous responses of groups I and II cat muscle spindle afferents to muscle position and movement, 429
Renshaw cells: *see* Interneurons
Respiration
septal area stimulation effect on, 394
Reticular formation
mesencephalic, sensory properties of neurons, 961
Retinal areas
visual receptive fields influenced by, 1154
Retinal projection
to striate and prestriate cortex, preciseness of, 366
Round window response
masking duration, effect on, 988
RUPERT, A., 1174
RUTLEDGE, L. T., 620, 1048

SAKANOUE, M., 672
Saltatory conduction: *see* Conduction, saltatory
SAMPSON, S. AND C. EYZAGUIRRE. Some functional characteristics of mechanoreceptors in the larynx of the cat, 464
SATO, T., 1011
SCHLAG, J. AND R. BALVIN. Sequence of events following synaptic and electrical excitation of pyramidal neurons of the motor cortex, 334
SCHMIDT, R. F., 78, 92, 1080, 1096
SEARS, T. A., 63
SEGUNDO, J. P., 961
Sensory receptors
touch and mechanoreceptors in cat larynx, 464
Sensory system
sympathetic enhancement in behavioral arousal, 493
Septal area
electrical stimulation of, effect on blood pressure and respiration, 394
SHOFER, R. J., 117, 133
SIERRA, G., 961
Sleep
and waking, pyramidal tract activity during, 152
SMITH, F. D., 706
Sodium
concentrations in CSF, compared with plasma ultrafiltrate, 672
Somatosensory cortex
human, conscious sensation levels by electrical stimulation, 546
Somesthesis
role of lateral cervical nucleus in, 1
Somesthetic stimulation
and responses in opossum thalamus, 1026
Sound localization
auditory cortex ablation and, 15
Spike potential fields
extracellular, motoneuronal, orthodromic effects on, 928
extracellular, of single spinal motoneuron, during spike generation, 913
Spinal cord
activities, mechanisms of supraspinal actions upon, 579, 1117, 1127
pharmacological actions in inhibition, 1127
reticular versus cerebellar inhibition, 1117
primary afferent fibers, depolarization of, 63

Spinal motoneurons
extracellular potential fields, in spike generation, 913
monosynaptic, action site of short-lasting anesthetic, 408
orthodromically produced changes in extracellular fields, 928
Spinal reflex pathway
monosynaptic, thiamylal sodium site of action, 408
Spreading depression
single cortical neurons during, 1192
Squirrel monkey
visual cortex of, 366
STEFANIS, C. AND H. JASPER. Intracellular microelectrode studies of antidromic responses in cortical pyramidal tract neurons, 828
STEFANIS, C. AND H. JASPER. Recurrent collateral inhibition in pyramidal tract neurons, 855
Stretch reflexes
instability during chronic cerebellar ablation, 49
of α-motoneurons, effect of gamma motoneuron section on cerebellar stimulation of, 193
Strychnine
in reticular inhibition of α-extensor motoneurons, 1127
SUGA, N., 768
Supraspinal action
on spinal cord activity, 579, 1117, 1127
Sympathetic nervous activity
enhancement during behavioral arousal, 493
Synapses
inhibitory, postsynaptic, location on hippocampal pyramids, 592
Synaptic mechanisms
in cuneate nucleus, 78
Synaptic transmission
mechanisms of, in cuneate nucleus, 1096

TALBOT, W. H., 451, 1063
TASAKI, I. A new measurement of action currents developed by single nodes of Ranvier, 1199
TERZUOLO, C. A., 579
Thalamus
mammillothalamic tractomy, avoidance behavior after, 753
somesthetic region, sensitivity to somesthetic and auditory stimuli, 1026
Thiamylal sodium
action on monosynaptic spinal reflex pathway, 408
Tonal pattern discrimination
auditory cortex ablation and, 15
TROTH, R., 481
TSUCHITANI, C. AND J. C. BOUDREAU. Wave activity in the superior olivary complex of the cat, 814

VALLBO, A. B., 429
Vestibular nerve
stimulation of, effect on pyramidal tract neurons, 481
VIERNSTEIN, L. J., 517
Visual cortex
photically evoked afterdischarge in, origin of, 1048
retinal stimulation and, 366
VOORHOEVE, P. E., 1138

WAITE, R., 1026
Waking
and sleep, pyramidal tract activity during, 152
WARD, A. A., JR., 1192
WHITCOMB, M. A., 1174
WILSON, J. H., 172
WILSON, V. J. AND W. H. TALBOT. Pattern of discharge of flexor motoneurons, 451
WILSON, V. J., W. H. TALBOT, AND M. KATO. Inhibitory convergence upon Renshaw cells, 1063
WOODS, J. W. Behavior of chronic decerebrate rats, 635
WRIGHT, E. W., JR., 546

YOKOTA, T., 78, 92, 408, 1080